



## Waller Mill Reservoir 2007



This 360-acre water supply reservoir is owned by the City of Williamsburg and is located within the boundaries of Waller Mill Park, York County. The reservoir was originally constructed in 1942 with the intention of providing water to Camp Peary, but was eventually sold to the City of Williamsburg in 1945. A navigable tunnel connects the upper and lower portions of the reservoir. The upper section is smaller and relatively shallow (less than 10' deep) when compared to the lower section. The heavily wooded shoreline and the many branches and coves of the reservoir provide a very pleasing environment in which to hike, bike, fish and pleasure boat. Waller Mill Reservoir has been known to produce some large striped bass (some in the 25 to 30 pound range). The reservoir provides a rather diverse fishery that should interest anglers.

The Virginia Department of Game and Inland Fisheries conducted an electrofishing survey of Waller Mill Reservoir on April 26, 2006. The last electrofishing survey was on April 29, 2003. The 2006 sample was concentrated in 4 different regions of the reservoir to get a broad spectrum of the fish assemblage present. The water temperatures varied slightly from 19 to 20°C. Electrofishing efforts consisted of shocking along the shoreline habitat as close as possible, with the majority of the effort concentrated in the 2 to 4 foot depth range. A total effort of 2 hours of electrofishing yielded the collection of 12 fish species. This report will concentrate primarily upon the six fish species of largemouth bass, bluegill, white perch, redear sunfish, black crappie and striped bass.

Species	# Collected	Largest Length	Average Length
Largemouth Bass	128	22.5"	13.4"
Bluegill	50	6.9"	5.4"
White Perch	65	10.75"	9.3"
Redear Sunfish	38	9.1"	6.9"
Black Crappie	8	13.9"	11.6"
Striped Bass	6	37"	29.3"

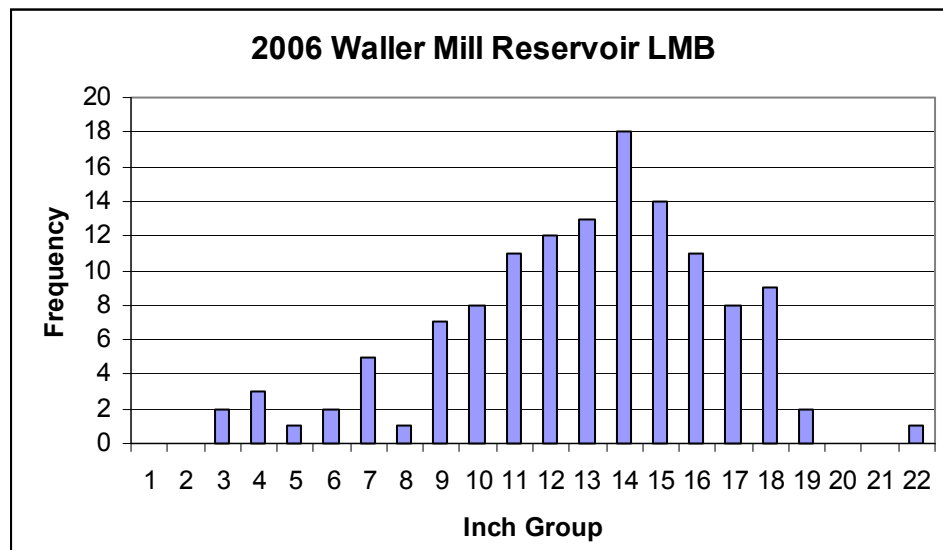
**Table 1.** Summary of the April 26, 2006 electrofishing survey for the primary fish species of Waller Mill Reservoir.

The largemouth bass population within Waller Mill Reservoir appears to be in decent shape and reasonably balanced. A total of 128 largemouth bass were collected. The CPUE (Catch Per Unit of Effort) for largemouth bass was 64 bass/hr. This catch rate compares favorably to other reservoirs in the region. The 2006 catch rate showed an increase from the 2003 sample (CPUE 33.6 bass/hr). The average sized bass measured

an impressive 13.4 inches. Refer to Table 2 for comparison of sample runs. The size distribution of the collected bass can be seen on the enclosed length frequency graph.

Run #	1	2	3	4
# of bass	31	28	38	31
Average size	12.05"	13.92"	13.67"	14"
Max size	22.52"	18.43"	17.36"	19.76"
CPUE	62	56	76	62

**Table 2.** Largemouth bass abundance values for each sampling run along with the average size, maximum lengths and CPUE (fish/hr).



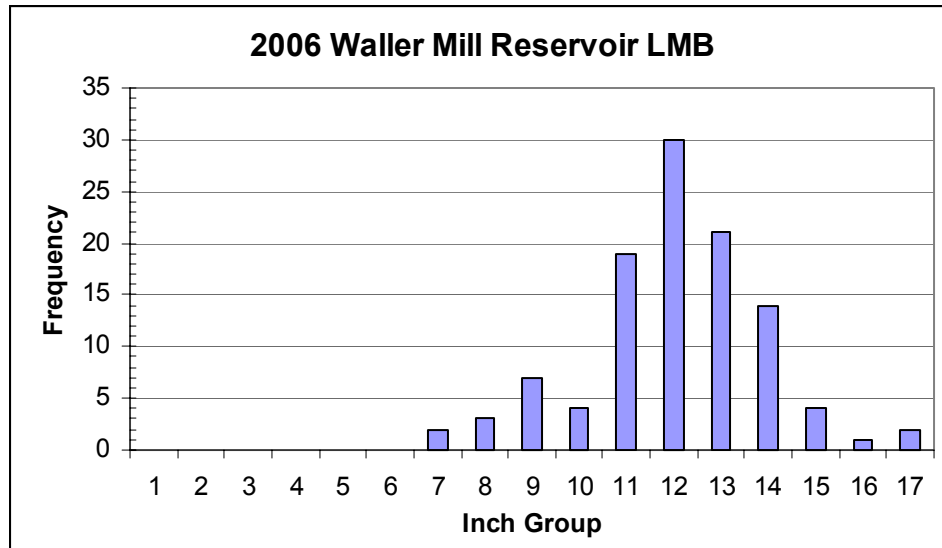
**Figure 1.** Length frequency distribution of largemouth bass collected from electrofishing survey of Waller Mill Reservoir on April 26, 2006 (N = 128, CPUE = 64 f/hr)

The 2006 distribution showed a high proportion of bass in the 11 to 18 inch size range (96 of 128 bass, 75%). These bass will provide a great deal of the fishing excitement. Only 14 bass less than 9 inches were collected. This limited abundance of bass may represent poor recruitment from the 2005-year class. No age-growth data was collected as all bass were released. The largest bass measured 22.52 inches and weighed 6.56 pounds. This bass was collected from the upper section of the reservoir. Our sampling efforts are just a representative picture of the fish community collected along the shoreline and various habitat structures on April 26, 2006. The reservoir has produced a limited number of trophy largemouth bass over the years. Larger bass may have been able to escape from the electrofishing boat or may just be living in other areas of the reservoir that were not sampled.

With largemouth bass being the most popular game fish in this country, it has been considered that a “preferred” bass is one that is over 15 inches in length. It is through this size classification that population dynamics are analyzed. The PSD (Proportional Stock Density) is the proportion of bass in the population over 8 inches (stock size) that are also at least 12 inches (quality-sized). The sample showed an extremely high PSD value of 78, which is a direct reflection of the 91 quality-sized bass. The sample had a total of 116 bass that were stock size or larger. A balanced bass/bluegill fishery has a bass PSD value within the 40 – 70 range. The RSD-P (Relative Stock Density of Preferred bass) is the proportion of bass in the population over 8 inches that are also at least 15 inches. The high RSD-P value of 40 is a direct reflection of the 46 preferred fish being collected. The 2006 PSD and RSD-P values are higher than the 2005 values (PSD = 61, RSD-P = 22).

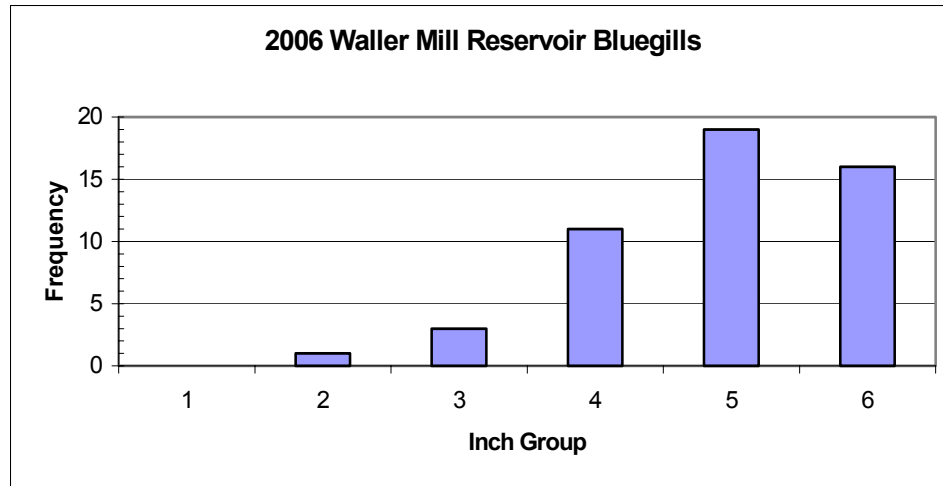
Weights were taken on largemouth bass to calculate relative weight values. Relative weight values are an indication of body condition. A value from 95 to 100 represents a fish that is in the healthy range and finding a decent amount of food. The higher the value, the better the condition of the fish in terms of overall body mass. The relative weight values for stock, quality, preferred and memorable bass (>8”, >12”, >15” and >20”) were 97, 99, 100 and 98 respectfully. These relative weight values showed and increase from the 2003 sample and fell within the desired range of 95 to 100.

The 2006 gill net survey was successful in collecting 107 largemouth bass. The CPUE of 4.88 f/100 m<sup>2</sup> is a surprisingly high catch rate and shows an increase from the 2003 gill net survey (CPUE = 0.76f/100 m<sup>2</sup>). Largemouth bass are usually not as abundant in gill nets as other species of fish. The abundance of bass in the nets might be directly related to the schooling nature of bass as they forage upon the schools of small gizzard shad. The bass were very active during the middle of November with 85 of the 107 bass collected during this time period. The upper lake sets were productive in catching 66 of the 85 bass collected during the November survey. A sub-sample of bass were used for a rough estimate on age and growth analysis. Otoliths were collected from 28 bass that did not survive being captured in the gill nets. These bass showed a very respectable growth rate. Mean lengths at age were: Age 2+: 12.3 inches, Age 3+: 13.9 inches and Age 4+: 15.2 inches. Only one Age 6+ bass of 17.8 inches was collected along with one Age 7+ bass that measured 15.8 inches.



**Figure 2.** Length frequency distribution of largemouth bass collected from the gill net survey of Waller Mill Reservoir on November 14-15, 2006 and December 14-15, 2006. (N = 107, CPUE = 4.88 f/100 m sq)

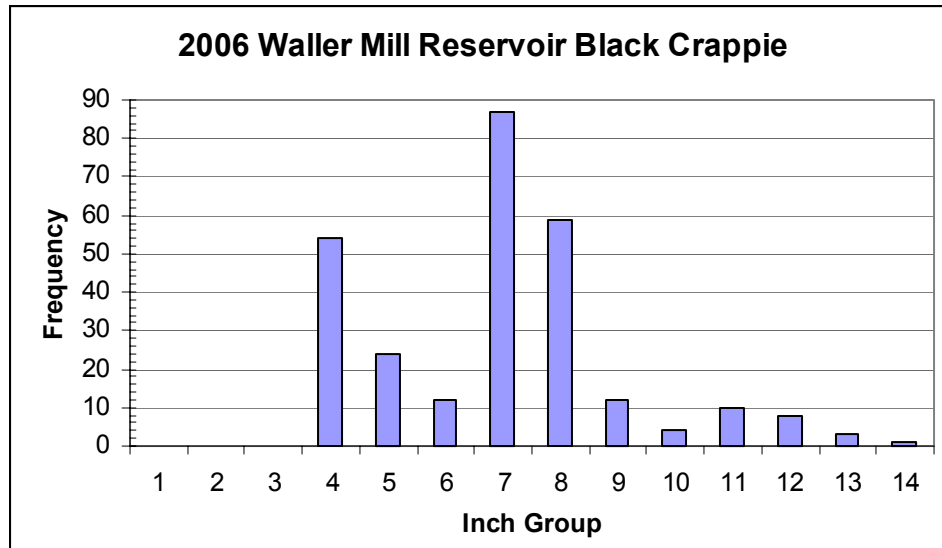
The bluegill fishery of Waller Mill Reservoir appears to consist of fish in the 4 to 6 inch range. The electrofishing survey was able to collect only 50 bluegills over the course of two sample runs (1 hour). This CPUE of 50 bluegills/hr shows a decline from the 2003 sample (128.2 bluegills/hr). The size distribution can be seen on the attached length frequency graph. The average sized bluegill was 5.4 inches in length. The PSD for bluegill is the proportion of bluegill over 3.15 inches (stock size) that are also at least 5.9 inches (quality size). The bluegill PSD value of 33 showed an increase from the 2003 survey (PSD=24). The collection consisted of only 16 quality-sized bluegills in the 6 to 6.9-inch range. The PSD value is within the desired 20 - 40 range that would represent a balanced bluegill population. The gill net survey collected a total of 50 bluegills for a CPUE of 2.28 f/100 m<sup>2</sup>. This CPUE showed an increase from the 2003 gill net survey (CPUE = 0.61 f/100 m<sup>2</sup>). The bluegills ranged in size from 3.5 – 6.9 inches and showed a similar distribution to the bluegills collected during the spring electrofishing.



**Figure 2.** Length frequency distribution of bluegills collected from the electrofishing survey of Waller Mill Reservoir on April 26, 2006 (N = 50, CPUE 50/hr)

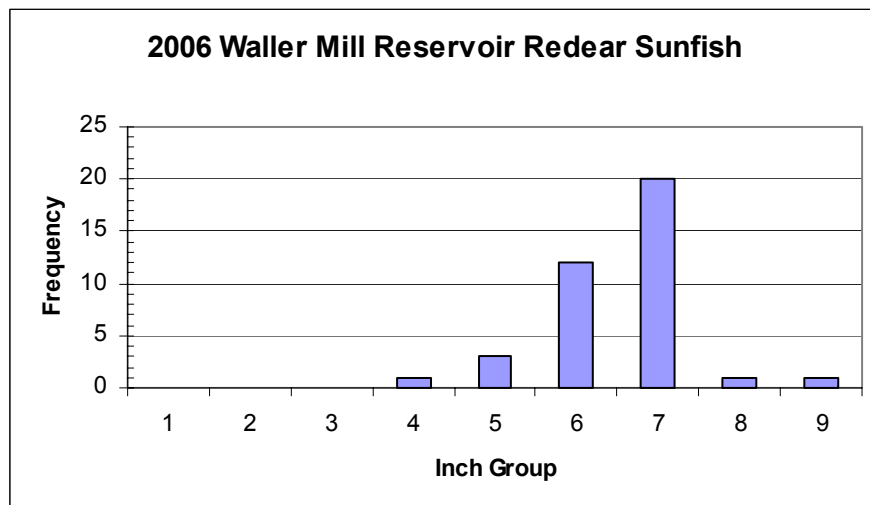
The electrofishing sample collected 8 black crappies (CPUE=4/hr). This catch rate is much lower than the 2003 sample (CPUE = 19.04/hr). Black crappies tend to school in waters deeper than bass and bluegills. Taking this into account, the typical shoreline sample can be very random as to whether or not a school is encountered during a sample run. The size distribution of the 2006 electrofishing survey was from the 8 to 13 inch range. The average black crappie measured 11.6 inches with the largest at 13.9 inches.

The gill net survey was successful in providing additional information on the black crappie population. Based upon the data collected, the black crappie population appears to be in decent shape with majority of sample consisting of crappies in the 9 to 11 inch range. A total of 274 black crappies were collected for an impressive CPUE of 12.47 f/100 m<sup>2</sup>. This catch rate is elevated well above the 2003 survey (CPUE = 4.25 f/100 m<sup>2</sup>). The collection of 274 black crappies from Waller Mill Reservoir is a rough representation of the black crappie fishery. The size selectivity of the experimental gill nets has a major influence on what sizes of fish are collected. Numerous black crappies in the 4 to 5 inch range were collected along with an abundance of crappies in the 7 to 8 inch range. Decent numbers of 9 to 12 inch crappies were collected with a handful of fish in the 13 to 14 inch range. The nets set in November were productive in catching 200 of the black crappies. The upper lake sets were able to collect 161 of those 200 crappies. Age and growth analysis of black crappies collected during the November gill net survey revealed good growth rates. The mean lengths at age for crappies were: Age 1+: 4.8 inches, Age 2+: 7.6 inches, Age 3+: 10.4 inches, Age 4+: 11.7 inches, Age 5+: 12.6 inches, Age 6+: 12.4 inches and Age 8+: 13.8 inches. Limited numbers of older fish were aged as the majority of the collection was represented by crappies of Ages 1+ and 2+.



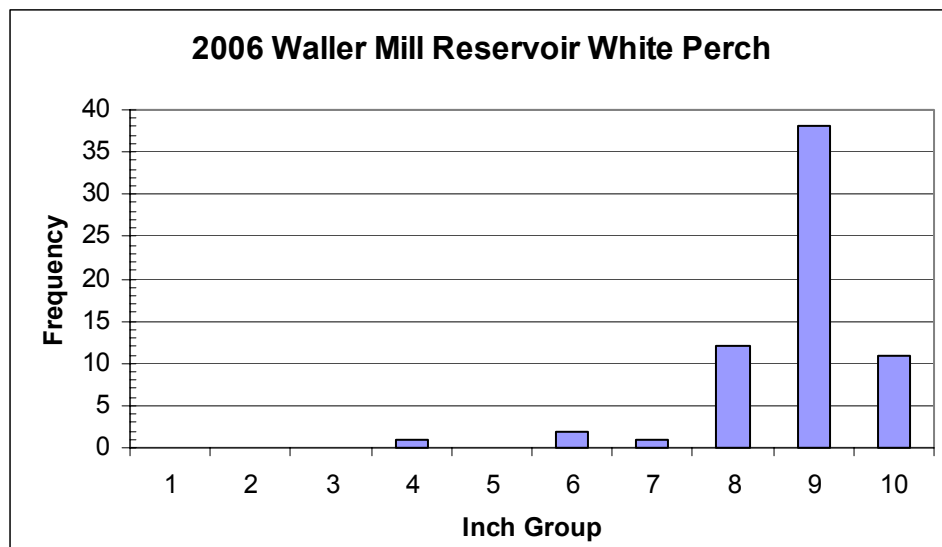
**Figure 3.** Length frequency distribution of black crappies collected from the gill net surveys of Waller Mill Reservoir on November 14-15, 2006 and December 14-15, 2006. (N = 274, CPUE = 12.47 f/100 m sq)

The redear sunfish population appears to be in fair shape even though abundance is limited. A total of 38 redear sunfish were collected for a CPUE of 38/hr. This catch rate is slightly higher than the 2003 sample (CPUE = 33.6/hr). The 2006 size distribution consisted of a large proportion (84%) of fish in the 6 to 7 inch range. The small sample size revealed the average sized redear sunfish to be 6.9 inches in length. The largest redear sunfish measured 9.1 inches long. The fall gill net survey collected only 16 redear sunfish. The majority of these fish ranged in size from 6 to 8 inches with the largest one measured at 9.4 inches.



**Figure 4.** Length frequency distribution of redear sunfish collected during the electrofishing survey of Waller Mill Reservoir on April 26, 2006 (N = 38, CPUE = 38/hr)

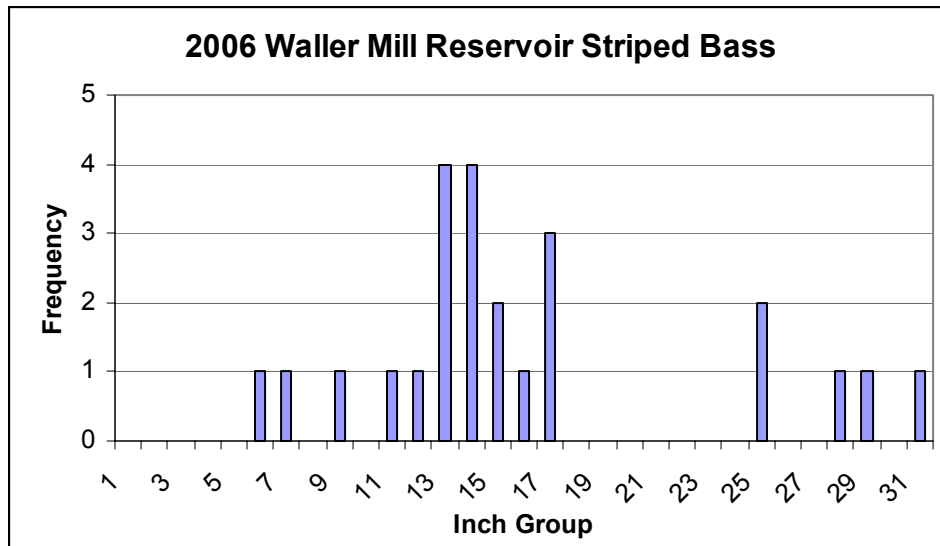
The electrofishing survey was able to collect a total of 65 white perch during two of the sample runs. The CPUE of 65/hr shows a decline from the 2003 survey (CPUE = 196.2/hr). Comparing catch rates samples is difficult. The random nature of encountering a large school of white perch has a great influence on your catch rate and how the population is perceived. The 2006 electrofishing survey showed the majority of white perch to be in the 8 to 10 inch range. The average white perch measured 9.3 inches and the largest white perch was 10.75 inches in length. The gill net survey was successful in catching 1,008 white perch. The CPUE of 33.6 f/100 m sq is very high and surpasses the rate encountered during 2003 (CPUE = 27 f/100 m sq). The white perch collected during the gill net survey ranged in size from 5 to 12 inches. The experimental gill nets use six panels of various mesh size. These mesh panels and the position of fish when they encounter the net can greatly influence the overall catch rate. The two main groups of white perch collected were in the 6 to 7 inch range and the 9 to 11 inch range. The white perch population will provide a great deal of the fishing action at Waller Mill Reservoir.



**Figure 5.** Length distribution of white perch collected from the electrofishing survey of Waller Mill Reservoir on April 26, 2006 (N = 65, CPUE = 65/hr)

The electrofishing survey was able to collect a total of 6 striped bass. Although the catch rate of 3/hr is not that impressive, it is still an improvement from the 2003 survey (N = 2, CPUE = 1.27/hr). The collection of striped bass during a daytime electrofishing survey is usually rather difficult. Striped bass tend to spend the majority of their time out in open water as they forage upon pelagic schools of baitfish (gizzard shad or blueback herring). The overcast conditions during the 2006 survey allowed the electrofishing boat to sneak up on the striped bass. The striped bass measured 26, 27, 28, 28, 28 and 37 inches. The fall gill net survey collected a total of 24 striped bass. The catch rate of 0.8 f/100 m sq was a slight increase from the 2003 survey (CPUE = 0.65 f/100 m sq). The November sampling was more productive than the December sampling.

A total of 19 striped bass were collected during the two nights in November. The upper lake sets produced a total of 6 striped bass while the lower lake sets yielded a total of 13 striped bass. The presence of young striped bass was detected with the collection of 5 stripers in the 6 to 12 inch range. The largest concentration was within the 13 to 17 inch range. Five striped bass in the 25 to 31 inch range were collected. Although the total number of striped bass was limited, age and growth analysis revealed the presence of striped bass from 7 years classes. The mean lengths at age were: Age 0+ (young of year): 7.1 inches, Age 1+: 9.4 inches, Age 2+: 13.9 inches, Age 3+: 16.7 inches, Age 4+: 17.5 inches, Age 6+: 27.2 inches and Age 7+: 31.8 inches.



**Figure 6:** Length distribution of striped bass collected from the gill net surveys of Waller Mill Reservoir on November 14-15, 2006 and December 14-15, 2006 (N = 24, CPUE = 0.8 f/100 m sq).

The fall gill net survey collected a total of 17 fish species. The survey collected a total of 86 white catfish. These white catfish ranged in size from 9 to 18.5 inches with the majority of them in the 10 to 15 inch range. The white catfish population appears to be one of the most abundant we have seen in many of the local reservoirs. The survey provided an abundance of gizzard shad with a total of 711 shad collected. The shad ranged in size from 5 to 17 inches. The majority of the shad were in the 5 to 8 inch range. These shad will provide a good forage base for the striped bass and largemouth bass. Another large accumulation of shad was within the 14 to 16 inch range. These large shad have outgrown many of the predator fish in Waller Mill Reservoir. A 25 to 30 pound striped bass might be able to feed upon these larger shad. The remaining 9 species not already mentioned were channel catfish, common carp, brown and yellow bullheads, longnose gar, yellow perch, pumpkinseed sunfish, golden shiner and redbreast sunfish. These species were collected in limited abundance and will provide some excitement to anglers that fish the reservoir.